Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

Vol. 40 No. 7

BULLETIN

OF THE

TORREY BOTANICAL CLUB

JULY, 1913

Studies on the West Indian Vernonieae, with one new species from Mexico

HENRY ALLAN GLEASON

Seven years ago, in the Revision of the North American Vernonieae,* forty-three species and one variety of *Vernonia* were recognized from the West Indies, together with several species of other genera. Since that time, the New York Botanical Garden has been actively engaged in the systematic exploration of these islands, especially Cuba, and has accumulated much valuable material. Director N. L. Britton has recently extended to me the facilities of the Garden, and has given me the opportunity to examine the new material in this tribe of Carduaceae. The results of this study are herewith presented.

Of the forty-four species and varieties recognized in the revision, three have been found untenable and are reduced to synonymy: *V. sublanata* Gleason, *V. Thomae* Benth., and *V. Sintenisii* (Urban) Gleason. The variety has been raised to specific rank. Four old species, not recognized in the revision, are shown by the recent collections to be distinct, and are admitted as species: *V. acuminata* Lessing, *V. Ottonis* Sch.-Bip., *V. Wrightii* Sch.-Bip., and *V. fruticosa* (L.) Sw. For the identification of the latter, we are indebted to Dr. Urban, who has also described a new species, *V. Tuerckheimii*. The collections at the Garden, supplemented by some material loaned by the Gray Herbarium and the Missouri Botanical Garden, are also found to contain seventeen

---

* Bull. N. Y. Bot. Gard. 4: 144–243. 1906.

[The BULLETIN for May 1913 (40: 193–248. *pls. 9–14*) was issued May 20; the BULLETIN for June 1913 (40: 249–304. *pls. 15–19*) was issued June 18.]

new species, which are here described. The total number of species of *Vernonia* recognized from the West Indies at the present time is therefore sixty-three. In addition, an Asiatic species escaped or adventive in Guadeloupe has been found to differ from *Vernonia* in particulars important enough to warrant its segregation, and a new species of the related genus *Eremosis* has been described from Mexico.

CYANTHILLIUM Blume, Bijdr. Flora Nederl. Indie 889. 1826

Isonema Cass. Bull. Soc. Philom. **1817**: 152. 1817. Not *Isonema* R. Br., 1809.

Cyanthyllium Blume, Flora Javae 1: vi. 1828.

Cyanopis Blume, Flora Javae 1: vi. 1828; DC. Prodr. 5: 69. 1836.

Cyanopsis Endl. Ench. 232. 1841. Not *Cyanopsis* Cass. Bull. Soc. Philom. **1817**: 200. 1817.

Claotrachelus Zoll. Nat. en Geneesk. Arch. Neêrl. Indie **2**: 565. 1845, *fide* Hoffman, in Engl. & Prantl, Nat. Pfl.-Fam.

The genus differs from *Vernonia* in its very fragile, uniseriate pappus, and its 4–5-angled achenes.

Cyanthillium chinense (Lam.) comb. nov.

Eupatoria conyzoides foliis glabris summo caule ramosior, lamii folio flore purpureo Pluk. Phytographia *pl. 177. f. 2.* 1691.

Conyza chinensis Lam. Encyc. 2: 83. 1786.

Conyza patula Ait. Hort. Kew. 3: 184. 1789.

Isonema ovata Cass. Dict. Sc. Nat. 24: 25. 1822.

Conyza odorata Willd. in Spreng. Syst. 3: 511. 1826.

Cyanthillium villosum Blume, Bijdr. Flora Nederl. Indie 889. 1826.

Cyanthillium pubescens Blume, Bijdr. Flora Nederl. Indie 890. 1826.

Centratherum chinense Less. Linnaea **4**: 320. 1829.

Vernonia chinensis Less. Linnaea **6**: 105, 674. 1831.

Cyanopis pubescens DC. Prodr. 5: 69. 1836.

Cyanopis villosa DC. Prodr. 5: 69. 1836.

Claotrachelus rupestris Zoll. Nat. en Geneesk. Arch. Neêrl. Indie **2**: 565. 1845.

As long ago as 1829 Lessing mentioned a specimen of this species from the "insulis Caribaeis" in Willdenow's herbarium. The herbarium of the New York Botanical Garden now contains a specimen from Guadeloupe, *Duss 4032*, where it occurs in a single locality. It is therefore admitted as a member of the North American Flora.

SPECIES-GROUP ARBORESCENTES

Vernonia icosantha DC. Occurs also in Guadeloupe Island, *Duss 2812.*

Vernonia arborescens (L.) Sw. This species, typically of Jamaica, occurs also in Grand Cayman, *Hitchcock*, in the herbarium of the Missouri Botanical Garden.

Vernonia amaranthina sp. nov.

Apparently herbaceous and freely branched, height not reported; stem and branches straight, striate, closely and softly pubescent or tomentulose, the branches ascending; leaves spreading, firm, rather dull green, ovate-lanceolate to narrowly oblong-elliptical, the principal ones 7–9 cm. long by 2–3 cm. wide, acute or short-acuminate, entire or somewhat irregular at the margin, but not serrate, narrowed to an acute base, minutely papillose-pubescent and scabrellate to the touch above, pubescent, especially along the veins, and minutely glandular beneath, veins conspicuous, elevated beneath, the lateral ones strongly ascending; petioles definite, 5–10 mm. long, pubescent or tomentulose; inflorescence freely branched and spreading; cymes short, naked below and bearing 2–5 heads aggregated near the tip, or separated by internodes less than 1 cm. long; rameal leaves resembling the cauline but smaller, those subtending the cymes narrowly oblanceolate, 1–2 cm. long, those subtending the heads linear to narrowly oblanceolate, shorter than or barely equaling the involucre; heads 21–29-flowered, sessile; corolla purple; involucre campanulate, about 5 mm. high, its scales purplish, thinly pubescent, irregularly imbricated, the outer triangular to ovate, sharply acute and somewhat cuspidate, the inner oblong, rounded to a mucronulate tip; achenes densely hirsute, 1.5 mm. long; pappus white, 4 mm. long, the outer series conspicuous.

Type, *E. G. Britton 2897*, from "Greenland," Jamaica, March 13, 1908, in the Herbarium of the New York Botanical Garden. *Britton & Hollick 2133*, from Green Island, Jamaica, is also referred here. The latter is a virgate plant 2 meters high, and the inflorescence is consequently small and composed of relatively few heads. It differs in no essential way from the type.

V. amaranthina is distinguished from *V. arborescens*, its nearest relative, by the rounded and mucronulate inner scales of the involucre and its short contracted cymes, contrasting with the acute or acuminate inner scales and elongated cymes of *V. arborescens.*

Species-group Araripenses

A. Leaves of a linear type, 1–5 mm. wide, one-nerved, more or less revolute.
1. Leaves linear to narrowly lanceolate, 3–5 mm. wide; inner scales broadest above the base, purplish or brown; middle and outer scales glabrate; pappus tawny or pale brown. *Vernonia araripensis.*
2. Leaves 1–4 mm. wide, linear; inner scales broadest near the base; all scales densely strigose, pale-green; pappus white or very pale yellowish-brown.
a. Leaves 3–8 cm. long, densely papillose-pubescent above; inflorescence divaricately branched; heads 18–21-flowered. *Vernonia stenophylla.*
b. Leaves 1–3 cm. long, strigose-hispid above; inflorescence slender, virgate; heads 11-flowered. *Vernonia corallophila.*

B. Leaves 4–20 mm. wide, narrowly oblong to oblong-obovate, mucronate; inner scales broadest above the base; all scales strigose-pubescent; pappus white or nearly so.
1. Leaves narrowly oblong with parallel sides, without conspicuous lateral veins beneath. *Vernonia angustata.*
2. Leaves broadest near or above the middle, veiny. *Vernonia gnaphaliifolia.*

The status of the first three species in the key above is still open to question and may require future adjustment. Gardner's type locality for *V. araripensis* was in Brazil, and it is scarcely probable that the same species occurs in the Antilles, especially as far as Cuba or Santo Domingo. Authentic specimens of Lessing's *V. stenophylla* have not been seen, and the plants referred to his name differ in some slight features from the original description. Both species are accepted solely on the authority of certain European students of the genus.

Vernonia corallophila sp. nov.

Stem erect, herbaceous, 4 dm. high, virgate, finely striate, strigose-pubescent; leaves sessile, narrowly linear, rigid, revolute, one-nerved, 1–3 cm. long, strigose-hispid and punctate above, densely strigose-pubescent beneath; inflorescence cylindrical or sparingly branched; heads 11-flowered, in the axils of the upper leaves or rarely 2 or 3 together on a short ascending lateral cyme; bracteal leaves resembling the cauline, but reduced in size and the upper barely exceeding the heads; involucre turbinate, 5–6 mm. high, its scales all straight, erect, very loosely imbricated, strigose-pubescent, the outer subulate, the inner narrowly oblong, long-acuminate; achenes pubescent, 2 mm. long; pappus nearly white, the inner series 4–5 mm. long.

Type, *Britton 1939*, from a coral limestone beach at the United States Naval Station, Guantanamo Bay, Oriente, Cuba, March 17–30, 1909, deposited in the Herbarium of the New York Botanical Garden.

The species is readily distinguished by its slender virgate inflorescence and small leaves from *V. stenophylla* with its long leaves and divaricate inflorescence.

Vernonia angustata sp. nov.

Vernonia sublanata angustata Gleason, Bull. N. Y. Bot. Gard. 4: 177. 1906.

Herbaceous, height not stated; stems slender, puberulent or thinly pubescent, sparingly branched above; leaves thin, flat, spreading, narrowly oblong with parallel sides, 3–5 cm. long, 4–8 mm. wide, obtuse or rounded, mucronate, entire, acute at the base, thinly pubescent above, closely gray-tomentose beneath, one-nerved; petioles 1–2 mm. long; cymes few, widely spreading or horizontal, simple or sparingly branched, bearing 2–7 heads each; internodes 1–2 cm. long, depressed or gently curved between the heads; bracteal leaves like the cauline, but gradually reduced in size, and the upper only 1 cm. long; heads sessile, distinctly secund, about 18-flowered; involucre broadly campanulate, 6–7 mm. high, its scales loosely and irregularly imbricated, strigose-pubescent, acuminate or sharply acute, the outer lanceolate, the inner narrowly oblong; achenes pubescent, 2 mm. long; pappus white, the inner series 6 mm. long.

VERNONIA GNAPHALIIFOLIA Rich. in Sagra, Hist. Fis. Pol. Nat. Cuba 11: 34. 1850

Vernonia sublanata Gleason, Bull. N. Y. Bot. Gard. 4: 177. 1906.

Dr. Urban has established the identity of these two species by the examination of authentic material, and they are accordingly united here. The species appears to be common and widely distributed in Cuba from the province of Havana eastward.

SPECIES-GROUP DIVARICATAE

The history of this group of Vernonieae begins with the publication of *V. divaricata* by Swartz in 1806. This was followed in 1831 by Lessing's *V. acuminata*, and no further addition was made to the group until 1906, when Gleason described *V. albicoma* and *V. expansa*. During the last half-century *V. divaricata* and *V. acuminata* have been usually considered identical. The whole group, so far as known, is confined to Jamaica, and the ample collection in the Herbarium of the New York Botanical Garden includes seven distinct species.

At the present time the chief difficulty lies in determining to which of these seven species the old names *divaricata* and *acuminata* belong. Certain characters given by the authors in their original descriptions serve to exclude one or another of the species, and by this process of exclusion it is possible to arrive finally at a reasonable conclusion. It may be safely affirmed that the two species described below are the only ones examined to which these names can consistently be given, without doing violence to some important feature of the original description.

VERNONIA DIVARICATA Sw. Fl. Ind. Occ. 3: 1319. 1806

A straggling shrub, 1–2 m. high; leaves spreading, thin, bright green, elliptical or elliptical-lanceolate, 4–7 cm. long, 1.5–2.5 cm. wide, acute or subacuminate, entire, narrowed to an acute base, minutely puberulent above, thinly pubescent and finely punctate with minute pellucid glands beneath, sessile or with petioles 1–5 mm. long; inflorescence of numerous, lax, loosely flowered, divaricate cymes, bearing each 5–15 secund heads, and frequently prolonged into a leafy shoot; bracteal leaves oblanceolate to narrowly oblong, barely exceeding the 11–13-flowered heads; involucre campanulate, about 4 mm. high; scales thinly strigose-pubescent, the inner oblong, gradually narrowed to a rounded tip, the outer triangular-ovate, obtuse or acute.

The following specimens are referred here: JAMAICA: *Harris 8205*, altitude 500 m.; *Britton & Hollick 1996*, altitude 700 m.; *Britton 431, 679; Cockerell.*

VERNONIA ALBICOMA Gleason, Bull. N. Y. Bot. Gard. 4: 185. 1906

Stem woody, slender; leaves thin, bright green, elliptical or elliptical-lanceolate, 5–6 cm. long, 1.5–2.3 cm. wide, acuminate, subentire, tapering at the base, glabrate above, very finely pubescent or glabrous beneath; petioles 5–7 mm. long; upper leaves somewhat reduced; inflorescence of 1–3 curved spreading terminal cymes bearing each 5–10 sessile secund 18-flowered heads; bracteal leaves lance-oblong, the middle ones about equaling the involucre, which is broadly campanulate or hemispheric, 5 mm. high; scales erect, loosely and irregularly imbricated, nearly glabrous, the outer lanceolate, acuminate, the inner oblong, acute; pappus white.

Campbell 6152, from the foot of Long Mountain, Jamaica, altitude 115 m.

VERNONIA ACUMINATA Less. Linnaea 6: 663. 1831

Shrubby, height not stated; stem finely cinereous-puberulent; leaves thin, bright green, broadly ovate-lanceolate, 6–9 cm. long and half as wide, long-acuminate, entire, acute at the base, very sparsely and minutely puberulent on both sides, on petioles about 5 mm. long; inflorescence of numerous widely spreading freely branched cymes, the ultimate branches bearing 3–7 heads; rameal leaves lanceolate, 2–3 cm. long; bracts oblong-lanceolate to linear, those at the ends of the cymes only 6 mm. long; heads 18-flowered; involucre campanulate, about 5 mm. high, its scales all obtuse or the outer acute, pubescent, especially the outer series, the exposed portion of the inner series oblong.

Wight 20, from wooded hillsides, Port Antonio, Jamaica.

VERNONIA EXPANSA Gleason, Bull. N. Y. Bot. Gard. 4: 186. 1906

A straggling shrub 2.5–3 m. high, branching above; leaves numerous, rather crowded, thin, divaricate, ovate, 3–5 cm. long, 1.7–2.7 cm. wide, acute or subacuminate, entire, obtuse or broadly rounded at base, sparsely and finely pubescent, or nearly glabrous above; petioles 3 mm. long; upper and rameal leaves smaller, broadly elliptical, obtuse; inflorescence of several short cymes bearing each 3–6 heads; bracteal leaves equaling or much shorter than the involucre; heads crowded, sessile, 11-flowered; involucre broadly campanulate, 4 mm. high; scales all appressed, closely imbricated, glabrous or nearly so, rounded at the tip, the outer broadly ovate, the exposed portion of the inner ovate.

JAMAICA: *Harris 8796*, near Troy, altitude 2,000 ft., *Britton & Hollick 1956*, woods, Bluefields Mountain, altitude 750 m.

Vernonia pluvialis sp. nov.

Apparently erect and branched only near the top, height 4 dm. or more; stem finely striate, glabrate, or thinly pubescent, especially above; leaves spreading, or usually ascending, firm and rigid, oblong-ovate to subrhomboid, broadest conspicuously above the middle, the principal ones 3–5 cm. long by 1.1–1.9 cm. wide, acute, entire and subrevolute, gradually narrowed to an obtuse base, minutely puberulent on both sides and glandular-punctate below; veins not prominent, sessile or on petioles 1–2 mm. long; inflorescence of several short few-headed cymes in the axils of the upper leaves, forming a compact leafy panicle; bracteal leaves barely exceeding the heads, ovate to ovate-lanceolate; heads crowded in clusters of 2–7, or sometimes single, sessile, not at all secund, 8- (rarely 5-) flowered; involucre narrowly campanulate or subcylindric, 5–7 mm. high, its scales puberulent, well imbricated in several ranks, the outer ovate-triangular, acute or apiculate, the inner becoming oblong and slightly narrowed to an obtuse or rounded tip; achenes densely hirsute, not mature in the specimens examined; inner pappus pale brown, 4–5 mm. long on the immature achenes.

Type collected by Forrest Shreve on Blue Mountain Peak, Jamaica, May 14, 1906, and deposited in the Herbarium of the New York Botanical Garden. Other sheets in the same herbarium are *Nichols 20*, from moist woods, Morce's Gap, altitude 5,000 feet, *Nichols 120*, from the summit of Blue Mountain Peak, and *E. G. Britton 3856*, from Sir John Peak.

Vernonia proclivis sp. nov.

Shrubby, about 2 m. high; stem sparingly branched, finely striate, glabrate or thinly puberulent; cauline leave sconspicuously reflexed, bright green above, pale green beneath, thin, elliptic-oblong, widest at or near the middle, 6–8 cm. long by 2–3 cm. wide, distinctly acuminate, entire, gradually narrowed or subacuminate at base, glabrous and finely glandular-punctate with transparent globules above and minutely black-punctate beneath; veins prominent beneath; petioles 3–4 mm. long; rameal and bracteal leaves similar, but much smaller; inflorescence cylindrical or pyramidal, composed of numerous short, divaricate, irregularly branched cymes, forming a terminal panicle, and bearing each 4–10 sessile, crowded, 8-flowered heads near their tips; involucre narrowly campanulate, 4–5 mm. high, its scales erect, regularly imbricated in several ranks, thinly puberulent or glabrate, the outer ovate, with acute or apiculate tips, the inner oblong, slightly narrowed to a rounded tip; flowers purple to pale lavender; immature achenes densely pubescent; outer pappus pale brown, 0.4 mm. long, the inner brown, 4 mm. long.

Type, *Britton 102*, from Morce's Gap, near Cinchona, Jamaica, September 2–10, 1906, in the Herbarium of the New York Botanical Garden. Three other sheets in the same herbarium agree with it perfectly and are referred to the same species: *Marble 188*, from Cinchona, *E. G. Britton 3856*, from the Blue Mountains, and *Britton 4055*, from the Parish of St. Thomas. The latter was collected in March; the achenes are all discharged and the dry and brown involucre is widely open.

Vernonia reducta sp. nov.

Shrubby, freely branched above, height not stated; stem striate, glabrate below, becoming puberulent in the inflorescence; leaves spreading, firm, bright green above, paler beneath, narrowly elliptical-oblong or somewhat oblanceolate, broadest at or near the middle, the principal ones 4–4.5 cm. long by 1.2–1.6 cm. wide, sharply acute or subacuminate, entire or finely denticulate, gradually narrowed at the base, minutely puberulent on both sides and finely glandular-punctate beneath; petioles 2–5 mm. long; cymes numerous, terminating the stem and the upper branches, and forming a large loose pyramidal panicle; rameal and bracteal leaves resembling the cauline, but becoming narrower and smaller toward the ends of the branches, and finally barely exceeding the heads; heads crowded in clusters of 2–7, sessile or nearly so, not at all secund, 5-flowered; involucre narrowly campanulate or subcylindric, 5–6 mm. high, its scales puberulent on the back and regularly imbricated in several ranks, outer scales triangular, acute, and somewhat arachnoid-ciliate, the inner becoming oblong-linear, puberulent or glabrate, narrowed to an obtuse apex; achenes about 2 mm. long, hirsute; pappus rufescent, the outer series 0.5 mm., the inner 4–5 mm. long.

Type, *Britton 203*, from Sir John Peak, Jamaica, September

2–10, 1906, in the Herbarium of the New York Botanical Garden. Two other sheets in the same herbarium are *Britton 151*, from New Haven Gap, and *Shreve*, from Sir John Peak.

The seven species of the group may be distinguished by the following key:

A. Heads more or less secund, 11–18-flowered; involucre campanulate to hemispheric, distinctly spreading when press-dried; its scales loosely and irregularly imbricated in few ranks.
  1. Principal leaves about 3 times as long as broad.
    a. Heads 11–13-flowered; pappus brown. *Vernonia divaricata.*
    b. Heads 18-flowered; pappus white. *Vernonia albicoma.*
  2. Principal leaves twice as long as broad, or less.
    a. Leaves broadly ovate-lanceolate, distinctly acuminate; exposed portion of inner involucral scales oblong; heads 18-flowered; cymes freely branched. *Vernonia acuminata.*
    b. Leaves broadly ovate, acute or subacuminate; exposed portion of inner involucral scales ovate; heads 11-flowered; cymes sparingly branched. *Vernonia expansa.*
B. Heads not at all secund, 5–8-flowered; involucre narrowly campanulate or subcylindrical, even when press-dried; its scales rather uniformly imbricated in several ranks.
  1. Leaves spreading or ascending, nearly or quite sessile, distinctly oblong-obovate or subrhomboidal, 30–50 mm. long, acute; heads 8- (rarely 5-) flowered. *Vernonia pluvialis.*
  2. Leaves proportionately narrower or larger, broadest near the middle, more or less acuminate.
    a. Leaves elliptical-oblong, about 25 × 65 mm., conspicuously reflexed; heads 8-flowered. *Vernonia proclivis.*
    b. Leaves narrowly elliptical-oblong, about 14 × 45 mm., spreading; heads 5-flowered. *Vernonia reducta.*

SPECIES-GROUP FRUTICOSAE

When a sheet of Santo Domingan material came to hand, identified by Dr. Urban as authentic *V. fruticosa* Sw., it was at once seen that the species was entirely distinct from *V. rigida* and from the whole group to which *V. rigida* belongs. It was also seen that its nearest congeners were to be found among some undescribed species from eastern Cuba, with which it is accordingly grouped. As in several other species-groups, the chief similarity between the species included is in the general habit. The most striking common feature here is the broad, rugose or bullate leaf with reticulate venation, closely invested beneath by a dense tomentum. In the Jamaican species-group *Permolles*, with similarly bullate or rugose leaves, the pubescence is densely sericeous-hirsute rather than closely tomentose, and in *V. yunquensis* the character of the involucral scales separates the species at once. The seven species may be distinguished as follows:

I. Santo Domingan species; leaves oblong-ovate, truncate or subcordate at base, obtuse, repand; bracteal leaves not reduced; cymes very flexuous. *Vernonia fruticosa.*
II. Cuban species.
A. Inner involucral scales obtuse or rounded; leaves ovate-lanceolate. *Vernonia desiliens.*
B. Inner involucral scales sharply acute or acuminate.
1. Leaves oval to elliptic-oblong, obtuse or narrowed at the base, rugose and finely papillose-pubescent above.
a. Leaves more than half as broad as long, very blunt or rounded at the apex; straggling plant with white flowers. *Vernonia calophylla.*
b. Leaves less than half as broad as long, narrowed to an obtuse or subacute apex; plant erect, with light blue flowers. *Vernonia vicina.*
2. Leaves of a lanceolate or ovate type, broadest near the truncate or subcordate base, strongly bullate and rugose above.
a. Leaves acute or barely obtuse, gray-tomentose beneath; inflorescence loose; cymes elongated; inner involucral scales broadest just below the middle. *Vernonia neglecta.*
b. Leaves obtuse or rounded; inflorescence compact; cymes abbreviated; inner involucral scales broadest near the base.
* Leaves ovate-oblong, crenate or repand, brown-tomentose beneath; involucre densely pubescent; inner scales merely acute. *Vernonia calida.*
** Leaves broadly ovate or oval, entire or somewhat revolute, closely gray-tomentose beneath; involucre thinly pubescent or glabrate; inner scales sharply acuminate. *Vernonia semitalis.*

VERNONIA FRUTICOSA (L.) Sw. Fl. Ind. Occ. 3: 1323. 1806.

Stem very slender, freely and loosely branched, glabrous or puberulent in the inflorescence; leaves firm, ovate-oblong, 1–2 cm.

long by half as wide, obtuse or rounded at the tip, irregularly crenulate or subentire, rounded or subcordate at base, dark green and thinly but softly pubescent above, densely gray-tomentose beneath; petioles 1–2 mm. long; upper and terminal branches floriferous and strongly flexuous; bracteal leaves resembling the cauline in shape and size; heads single, sessile, 21-flowered; involucre broadly turbinate or campanulate, 5 mm. high, its scales all erect or somewhat spreading, very loosely imbricated, puberulent or glabrous, the outer subulate, the inner narrowly lanceolate and long-acuminate with a subulate tip; achenes hirsute; pappus nearly white, 4 mm. long.

For the identification of this obscure species of Swartz we are indebted to Dr. Urban. The description above is based on a single sheet, *Fuertes 655*, from the Province of Barahona, Santo Domingo, at 350 m. altitude.

Vernonia desiliens sp. nov.

Herbaceous, sparingly branched, 3–5 dm. tall; stem rather prominently striate, glabrous below, becoming puberulent in and near the inflorescence; leaves firm and coriaceous, ovate-lanceolate to narrowly elliptical, the largest on the type sheet 8–8.5 cm. long and 2.3–2.9 cm. wide, obtuse, entire or obscurely and shallowly crenulate, obtuse or rounded at the base, with petioles 1–3 mm. long, rugose, glabrous and shining above; veins elevated beneath and prominently reticulated, the principal lateral ones strongly ascending and almost parallel to the leaf-margin; the interstices of the reticulations closely gray-tomentose; cymes apparently one or two, terminal and from the upper axils, spreading, 1–2 dm. long, very flexuous; bracteal leaves resembling the cauline but narrower in shape and gradually reduced in size, oblong or narrowly elliptical, 3–5 cm. long, 5–12 mm. wide, spreading, those at the extremity of the cyme oblong-linear, 2 cm. long; heads sessile, single in the axils, 1–2 cm. apart, 21-flowered; corollas purplish; involucre turbinate, thinly pubescent, 9–10 mm. high; the lower outer scales short, minute, triangular, acute and apiculate, and closely imbricated; the inner scales much longer, linear-oblong, obtuse; achenes strigose-pubescent; pappus light brown, the inner series 6 mm. long, minutely barbellate, the outer series 0.5 mm. long, somewhat paler.

Type, *Shafer 3232*, growing among rocks near water, Arroyo del Medio, Oriente, Cuba, at 450–550 m. altitude, January 20, 1910, deposited in the Herbarium of the New York Botanical Garden.

Vernonia calophylla sp. nov.

A straggling shrub, 1 m. high or less; stem slender, striate, freely and loosely branched, cinereous-puberulent below, becoming tomentose in the branches; leaves firm and rigid, ovate to subrotund, the principal ones 20–25 mm. long by 13–18 mm. wide, rounded or obtuse at the apex, entire, somewhat revolute, rounded or subcordate at base, dark green, rugose, and papillose-pubescent above, closely invested beneath with silver-gray tomentum; veins conspicuous, the lateral ones ascending and the veinlets prominently reticulated; petioles 1–2 mm. long; heads in the axils of the upper leaves, forming cymes 10–16 cm. long, sessile, 18–21-flowered; bracteal leaves resembling the cauline, but smaller, 1–1.5 cm. long and more densely pubescent above; corollas white; involucre campanulate, 5 mm. high; scales somewhat arachnoid-puberulent, especially near their tips, the outer ones narrowly triangular, subulate, the inner linear-oblong, acute; achenes pubescent, 2 mm. long; pappus nearly white, the outer series 0.8 mm., the inner 4 mm. long.

Type, *Shafer 8102*, from Camp La Gloria, south of Sierra Moa, Oriente, Cuba, December 24–30, 1910, deposited in the Herbarium of the New York Botanical Garden.

Vernonia vicina sp. nov.

An upright shrub, 3–6 dm. tall, sparingly branched; stem finely striate, glabrate below, puberulent above, and in the branches closely cinereous-tomentulose; leaves firm and rigid, spreading, dark green above, elliptic to elliptic-oblong, the principal ones 3–4.5 cm. long by 1–1.5 cm. wide, broadest at or near the middle, narrowed to an obtuse or subacute tip and to an acute base, entire, somewhat revolute, rugose above, papillose-pubescent when young, becoming glabrate with age, closely invested beneath with thin yellowish brown or cinereous tomentum, especially between the veins; lateral veins ascending, but curved and approximate near the margin; veinlets prominently reticulated; petioles curved, 1–2 mm. long, tomentose; upper leaves like the lower, but smaller, eventually only 1 cm. long by 4 mm. wide, bearing heads in the upper 4–5 axils; heads about 26-flowered; flowers light blue, involucre campanulate, 5–6 mm. high, its scales closely imbricated, glabrous or thinly puberulent, outer scales subulate, somewhat spreading, inner scales lance-oblong, sharply acute; achenes pubescent, 2 mm. long; outer pappus white, 0.8 mm. long; inner series almost white, 4 mm. long.

Type, *Shafer 8202*, from Camp La Gloria, south of Sierra Moa, Oriente, Cuba, December 24–30, 1910, deposited in the Herbarium of the New York Botanical Garden.

Vernonia neglecta nom. nov.

V. Wrightii Griseb. Cat. Pl. Cuba 144. 1866. Not *V. Wrightii* Sch.-Bip. 1863.

Vernonia gnaphaliifolia Gleason, Bull. N. Y. Bot. Gard. 4: 178. 1906. Not *V. gnaphaliifolia* Rich. 1850.

Apparently erect and suffruticose, sparingly branched, 6–15 dm. high; stem and branches slender, obscurely striate, finely gray-tomentulose; leaves firm, flat, spreading, narrowly ovate-oblong to ovate-lanceolate, the largest on the type sheet 6–7 cm. long by 2 cm. wide, acute, or subobtuse and minutely apiculate, entire, rounded, truncate, or even subcordate at base, dark green and bullate above, papillose-puberulent when young, becoming glabrous and shining at maturity, softly gray-tomentose or almost villous beneath, especially along the elevated, prominently reticulated veins; petioles tomentose, 1–4 mm. long; cymes 2 or 3, terminal, spreading, 1.5–2.5 dm. long, straight, leafy; lower bracteal leaves ovate-lanceolate or lanceolate, about 3 cm. long by 1.3 cm. wide; the upper reduced, becoming oblong and only 1.5 cm. long; heads sessile, secund, about 21-flowered, separated by internodes 1–2 cm. long; corollas purple; involucre broadly campanulate, about 6 mm. high, its scales rather closely but irregularly imbricated, thinly pubescent or glabrate, the outer triangular and subulate, the inner ovate-lanceolate, sharply acute, somewhat scarious on the margin; achenes pubescent, 1.5 mm. long; outer pappus white, 0.9 mm. long, the inner series very pale brown or almost white, 4 mm. long.

Type, *Wright 1309*, on banks of cliffs near Monte Verde, eastern Cuba, deposited in the Gray Herbarium of Harvard University. The specimen bears two labels, one dated "Dec. 27," the other "Jan.–Jul. 1859." On the left-hand side of the same sheet is another specimen of the same species, also numbered *1309*, and collected in eastern Cuba, Sept. 1859–Jan. 1860. Another sheet of the same species in the Gray Herbarium is *Wright 2788*.

Vernonia calida sp. nov.

Shrubby, freely branched, 5 dm. tall; stem obscurely striate, thinly puberulent or finely cinereous-tomentulose in the inflorescence; leaves spreading, thick, rigid, ovate-oblong, the principal ones 3.5–5 cm. long and 1.5–2 cm. wide, obtuse or rounded at the tip, crenate or repand, broadly rounded or subcordate at base, strongly bullate, dark green, minutely papillose-pubescent when young, soon becoming glabrate or scabrellate and shining above, densely and softly brown-tomentose beneath; petioles 1–3 mm. long; lateral veins prominent, strongly curved and soon confluent; veinlets prominently reticulated; cymes few, simple or sparingly branched, 6–12 cm. long, the rachis densely tomentose; bracteal leaves resembling the cauline in shape, but smaller, crenulate or entire, the upper 1–1.5 cm. long; heads rather crowded, single or frequently two at each node, about 21-flowered, separated by internodes 1–2 cm. long; corollas pink; involucre broadly campanulate, 7 mm. high; scales densely pubescent, closely imbricated, or somewhat spreading at the tip, the outer subulate, the inner narrowly triangular-lanceolate and acute; achenes pubescent, 1.5 mm. long; pappus yellowish brown, the outer series 0.7 mm., the inner 5 mm. in length.

Type, *Shafer 8408*, in dry soil, Sabanilla to Yamuri Arriba, Oriente, Cuba, January 30, February 1, 1911, deposited in the Herbarium of the New York Botanical Garden.

Vernonia semitalis sp. nov.

Shrubby, 6–9 dm. tall, freely branched above; stem striate, leafy, thinly brown-tomentose, especially on the younger branches; leaves numerous and crowded, thick, rigid, somewhat revolute, divaricately spreading, ovate or ovate-triangular, broadest near the base, 1.5–2 cm. long by 1–1.3 cm. wide, obtuse or rounded at the apex, entire, truncate or subcordate at base; upper surface shining, glabrous or scabrellate, strongly bullate; lower surface closely invested with a thin gray-green tomentum; veins elevated beneath, the lateral ones ascending and confluent near the margin; veinlets prominently reticulated; upper leaves resembling the lower ones and scarcely reduced in size, bearing heads in their axils and forming several crowded cymes 10–15 cm. long; heads about 21-flowered, secund, the lower separated by internodes 1 cm. long, the upper approximate; corollas white; involucre campanulate, about 5–6 mm. high; outer scales triangular-subulate and pubescent, the inner narrowly triangular, sharply acuminate, glabrous or nearly so; achenes pubescent, 1.5 mm. long; pappus nearly white, the outer series 0.7 mm., the inner 4 mm. long.

Type, *Shafer 4176*, from pine land, altitude 400 m., along the trail from Rio Yamaniguey to Camp Toa, Oriente, Cuba, February 22–26, 1910, deposited in the Herbarium of the New York Botanical Garden.

SPECIES-GROUP SAGRAEANAE

This group is distinguished at once from other West Indian species by the large glabrous achenes. The leaves also are usually thick and firm or coriaceous, entire or with spinulose teeth. Most of the species have been in the past poorly represented in American herbaria, and some of them have been seldom collected since their original discovery.

In the revision, *Vernonia rigida* Sw. and *Vernonia fruticosa* (L.) Sw. were regarded as identical and referred to this group, to which the name *Rigidae* was applied. Since that time, specimens of *V. fruticosa* have again been collected, and the species is seen to belong to a different group. The Jamaican *V. rigida*, also, is described with pubescent achenes, a character which removes it at once from this group.

In 1836 De Candolle described *V. Sagraeana* from Cuba, the first known species of the group. This was followed in 1850 by *V. Valenzuelana* of Richard. In 1863 Schultz examined the recent Cuban collections of Wright, and added three species, *leptoclada*, *inaequiserrata* and *Wrightii*, and a fourth, *Sprengeliana*, based on a plant collected by Bertero in Santo Domingo. Grisebach added a variety, *inaequiserrata angustifolia*, also collected by Wright in Cuba. That left the group with seven species and one variety, and, so far as known to the writer, no authentic collection of any of these was made or at least recognized for forty years. Further difficulty was added by the confusion of numbers of some of Wright's collections, so that at least two different species have masqueraded in herbaria under wrong names. One case of this confusion was recognized in 1906 by Gleason, who remedied it by the description of *V. viminalis*.

Since 1906, the collectors of the New York Botanical Garden, in their diligent explorations of Cuba, have recollected four of these old, imperfectly known species, and have added three entirely new forms, which are here described.

The group as a whole is one of the most easily recognized of all the West Indian species. It is characterized especially by a high involucre and by large, glabrous, obscurely ribbed achenes, with a prominent basal callus, and the large, firm or rigid leaves.

- I. Species of Santo Domingo; leaves oblong, very tomentose beneath, rugose and scabrous above, narrowly oblong, attenuate from the middle to a truncate or subcordate base; inner involucral scales rounded and apiculate at the tip. *Vernonia Sprengeliana.*
- II. Species of Cuba.
  - *A*. Leaves thick, coriaceous, more or less revolute and shining above, oblong or ovate-lanceolate, remotely dentate or entire.
    - 1. Heads 8-flowered; involucre cylindric. *Vernonia purpurata.*
    - 2. Heads with 18 flowers or more; involucre campanulate.
      - *a*. Leaves narrowly oblong, at least three times as long as broad, entire, or with numerous minute spinulose teeth. *Vernonia Valenzuelana.*
      - *b*. Leaves broadly oblong, about twice as long as broad, entire, or with a few few remote but conspicuous teeth.
        - * Scales of the involucre all erect or barely spreading, the inner acute, the outer mucronate. *Vernonia leptoclada.*
        - ** Outer scales conspicuously squarrose or reflexed, all sharply acuminate or subulate. *Vernonia Wrightii.*
  - *B*. Leaves thin or firm, but not coriaceous, flat, serrate, spinulose-denticulate, or entire.
    - 1. Leaves puberulent or glabrous beneath.
      - *a*. Outer scales of the involucre short, acute or mucronulate, appressed. *Vernonia Sagraeana.*
      - *b*. Outer scales of the involucre elongated, subulate, spreading. *Vernonia aronifolia.*
    - 2. Leaves tomentose beneath.
      - *a*. Middle involucral scales sharply acuminate, densely ciliate. *Vernonia viminalis.*
      - *b*. Middle involucral scales rounded to a mucronate apex, or acute.
        - * Inner scales obtuse or subacute; middle scales without scarious margin; leaves entire or obscurely spinulose-denticulate. *Vernonia fallax.*
        - ** Inner scales apiculate; the middle with a scarious margin.
          - ° Leaves narrowly linear-oblong, entire. *Vernonia aceratoides.*
          - °° Leaves narrowly elliptic-oblong, sharply serrate. *Vernonia inaequiserrata.*

Vernonia Sprengeliana Sch.-Bip. The type specimen cited by Schultz is *Bertero 507* and the recent description by Gleason is based on a single sheet of *Wright, Parry, & Brummel 273*. An excellent collection of this rare species, *Fuertes 1388*, has been recently distributed and agrees perfectly with the original description and with that of Gleason (Revision, 184).

Vernonia purpurata sp. nov.

Shrubby, 2–2.5 m. tall; stem stout, coarsely striate, thinly tomentose below, becoming densely so in the inflorescence; leaves crowded, heavy, rigid, coriaceous, divaricate, elliptic-oblong, obtuse or subacute, entire or irregularly repand, obtuse or rounded at base, strongly rugose above, but glabrous and shining except for some thin pubescence along the midvein, minutely puberulent along the veins beneath; veins elevated on the lower surface, the lateral veins prominent, ascending, the veinlets small and closely reticulated; petiole 2–4 mm. long, tomentose; inflorescence small, irregular, composed of several short (2–6 cm.) leafy cymes, bearing each 4–10 heads; rameal leaves resembling the cauline, but two thirds as long; bracteal leaves narrowly oblong or oblong-linear, 10–15 mm. long, not present below many of the heads; heads sessile, secund along the cymes or aggregated at their tips, 8-flowered; corollas white; involucre narrowly cylindric, 6 mm. high; scales closely imbricated, appressed, sharply acute, the lower ovate-triangular, pubescent, the middle ones with an ovate-triangular exposed portion, ciliate, glabrous on the back, the inner entire, puberulent on the back, purple-brown at their exposed tips; achenes glabrous, immature in the type specimen; pappus pale yellow-brown, the outer series 1.3 mm., the inner 7 mm. long.

Type, *Taylor 544*, from Jiquarito Mountain, Sierra Maestro, eastern Cuba, altitude 1,020 m., September 18, 1906, deposited in the Herbarium of the New York Botanical Garden.

The lower leaves are lacking from the type plant. The crowded upper leaves are remarkably uniform in size, 4–5 cm. long by 1.5–1.9 mm. wide. On another branch is the base of a leaf which measures 3 cm. wide, indicating that the lower leaves are considerably larger than the upper. While the species certainly belongs to this group, it is distinguished from all the others known by its few-flowered heads.

Vernonia Valenzuelana Rich. A shrub 1.2 m. high, on dry ferruginous soil, southeast of Paso Estancia, Oriente, Cuba, *Shafer 1705*.

Vernonia leptoclada Sch.-Bip. A specimen agreeing perfectly with the original description has been recently collected by Shafer, *8145*, from Camp La Gloria, south of Sierra Moa, Oriente, Cuba. It is described as a straggling shrub 3.5 m. tall, with white flowers.

Vernonia Wrightii Sch.-Bip. *Ex descr.* A shrub, 1 m. high, freely branched above; stems pubescent; leaves heavy and coriaceous, spreading or ascending, ovate-oblong to oblong, 3.5 cm. long by 1.2 cm. wide, sharply acute or mucronate, revolute, entire or with a few remote spinose teeth, rounded or even subcordate at the base, very scabrous above but not pubescent, minutely puberulent under the lens beneath; petioles 1–2 mm. long, pubescent; cymes long and spreading, with numerous heads; bracteal leaves like the cauline, but gradually reduced to 1 cm. long; heads sessile, secund, about 21-flowered; involucre about 7–8 mm. high, outer scales ovate, acuminate into a squarrose or recurved tip, the inner erect or somewhat spreading, sharply acute or subulate; pappus pale brown.

Shafer 7738, from a dry serpentine hill near El Yunque, Oriente, and *Shafer 3072*, from pine lands at 500–650 m. altitude near Woodfred, Oriente, are referred here. They agree in most essential points with Schultz' description of *V. Wrightii* (Journ. Bot. **1**: 234. 1863), but lack the glabrous leaves narrowed at both ends and the sordid-purple pappus.

Schultz' species is based on *Wright 1309*. As is well known, the Wright numbers are much confused, and frequently shelter more than one species. The only available specimen of this number belongs to an entirely different species.

Vernonia Sagraeana DC. A shrub 1.5 m. tall, growing on banks at an altitude of 325 m., near El Cuero, Oriente, *Britton & Cowell 12794*.

Vernonia aronifolia sp. nov.

Bushy, suffrutescent or shrubby, 12–15 dm. high; stem stout, freely branched, striate, finely and thinly tomentose, the tomentum increasing in density toward the tips of the branches and always most abundant in the axils; leaves dark green, thin but firm, obovate-oblong, about 8 cm. long by 4 cm. wide, abruptly acuminate, remotely denticulate with subulate or spinulose teeth 0.5

mm. long, standing at right angles to the margin, obtuse or subacute at base, minutely puberulent beneath, especially along the veins, glabrous above; veins prominent, light green, the lateral ones arcuate-ascending, branched and reticulated, especially toward the margin, one of the smaller marginal veins prolonged into each denticulation; cymes terminal and lateral, spreading, unbranched, 15–20 cm. long, very leafy, bearing 6–10 heads; bracteal leaves resembling the cauline in shape and texture, or varying to broadly oblong-elliptic in shape; the lower approximating the cauline in size, the upper gradually reduced to half the size, but always greatly exceeding the flowers; heads sessile, single in the axils, about 34–47-flowered; corollas white; involucre hemispherical or broadly campanulate, 8–9 mm. high, in dried specimens about 15 mm. broad; scales thinly puberulent, imbricated only at the base, straight or erect in bud, becoming spreading or flexed in fruit, the outer lance-linear, subulate, the inner linear-oblong, acuminate to a subulate tip; achenes smooth; outer pappus white, 0.8 mm. long, inner series pale brown or nearly white, 8 mm. long, minutely barbellate.

Type, *Shafer 13514*, collected from high rocks in limestone hills, vicinity of Sumidero, Province of Pinar del Rio, Cuba, August 2, 4, 1912, deposited in the Herbarium of the New York Botanical Garden. The collection is represented by two sheets, one including apparently the top of the plant, and the other two detached lateral branches.

Vernonia fallax sp. nov.

Shrubby, 1 m. high; stem erect, sparingly branched, finely striate, closely gray-tomentose, especially above; leaves firm, bright green above, elliptic-oblong, 5–7 cm. long by 2–2.5 cm. wide, acute, mucronate, entire or very obscurely and remotely spinulose-denticulate, narrowed to an acute base, thinly puberulent above, especially on the veins, finely and closely gray-tomentose beneath; veins elevated and prominent beneath, not conspicuously reticulated; petioles 1–2 mm. long; inflorescence pyramidal, terminal, of about 4–10 short, spreading or recurved cymes bearing each 3–7 heads; heads secund, sessile, about 21-flowered; involucre broadly campanulate or subhemispherical, 6–7 mm. high, its scales appressed, closely imbricated, pubescent, especially near the tip, outer scales ovate-triangular, acute and cuspidate, the inner subacute or rounded at the tip; outer pappus white, 0.7 mm. long, the inner pappus very pale brown, 6 mm. long; achenes glabrous.

Type, *Britton & Wilson 5478*, from a hillside, altitude 500 m., in the Trinidad Mountains, Province of Santa Clara, Cuba, March 12, 1910, deposited in the Herbarium of the New York Botanical Garden.

The bracteal leaves have all fallen off the type specimen, except a few fragments, and the leaves are crowded on short lateral branches. The inflorescence is thus left at the end of a naked peduncle 2–3 dm. long, giving the specimen an aspect entirely unlike other species of the group. It is scarcely to be expected that the same peculiarity will be maintained in other collections of the species.

Vernonia aceratoides sp. nov.

Vernonia inaequiserrata angustifolia Griseb. Cat. Pl. Cuba 144. 1866.

Slender and probably herbaceous; stem finely striate, closely gray-tomentulose; leaves firm, spreading or ascending, narrowly oblong-lanceolate or lance-linear, the principal ones 7–8 cm. long and 1–1.2 cm. wide, acute and mucronulate at the tip, entire or somewhat repand; obtuse or rounded at the base, minutely scabrellate above and puberulent along the midvein, finely brown-tomentulose beneath; veins prominent beneath and conspicuously reticulated; petioles 2–3 mm. long; inflorescence terminal, of about 3 short divaricately spreading cymes, bearing each six or seven secund heads; bracteal leaves oblong, the upper ones not exceeding the heads, and all proportionately broader than the cauline; involucre narrowly campanulate, 5–6 mm. high; scales closely and regularly imbricated, appressed, the outer ovate-triangular, cuspidate, the inner with an ovate exposed portion, rounded and apiculate at the tip.

Grisebach's variety was based on a specimen of *Wright 2784;* the preceding more detailed description is based on a sheet of the same number in the Herbarium of the Missouri Botanical Garden.

SPECIES-GROUP LONGIFOLIAE

The herbarium of Dr. Otto Kuntze contained a good specimen of a *Vernonia* from St. Thomas, collected by Kuntze himself in 1874, and labeled *Vernonia Thomae* Benth. It can not be distinguished, however, in any essential character from *Vernonia albicaulis* Pers., and the two species may henceforth be considered identical. This disposition of *V. Thomae* was suggested before by Gleason (Revision, 191), although at that time the two were kept separate since good material for examination was lacking. The island of St. Thomas is accordingly added to the known distribution of *V. albicaulis.* It has been collected in St. Thomas by others also, and is represented in the herbarium of the Field Museum by two sheets, *Millspaugh 522* and *Eggers 34*.

Vernonia longifolia Pers. To the distribution of this species may be added St. Martin, *Boldingh 2641*, and Montserrat, *Shafer 172, 589, 659, 661.*

Lepidaploa, *Scorpioideae reductae*

Vernonia arctata Gleason. The species was originally described (Bull. Torrey Club 33: 185. 1906) from New Providence Island, of the Bahama group, but is now known to occur also throughout Andros Island, *Small & Carter 8506, 8613, 8759, 8890, Brace 5176, 6754, 6926, 7138.* Field data show that the flowers vary from purplish white to bright rose-purple and that the plant reaches a height of 2 meters.

Vernonia bahamensis Griseb. Reported by Gleason (Bull. Torrey Club 33: 187. 1906) from Fortune Island and Inagua, it is now represented also by specimens from Crooked Island, *Brace 4851;* Acklin's Island, *Brace 4330;* Salt Cay, *Millspaugh & Millspaugh 9249;* Long Cay, *Brace 4152, 4020, 4115;* Mariguana, *Wilson 7461;* Castle Island, *Wilson 7783;* Cotton Cay, *Millspaugh & Millspaugh 9362;* North Caicos, *Wilson 7721, Millspaugh & Millspaugh 9175;* East Caicos, *Millspaugh & Millspaugh 9082;* and South Caicos, *Wilson 7688.* The last specimen cited has leaves subacuminate or merely acute at the base, 5 cm. long by 2.5 cm. wide, and in general closely approximates *V. albicaulis* Pers. The *Scorpioideae reductae* have been considered (Gleason, Revision, 165, 166) as related by origin to the species-group *Longifoliae*, to which *V. albicaulis* belongs, and the theory is strengthened by the strong superficial resemblance just mentioned. It is interesting to note that *V. bahamensis* occupies the southeastern portion of the Bahama archipelago, nearest the area of the *Longifoliae*, and that the particular specimen comes from South Caicos, which is almost the extreme southeastern island of the group.

Vernonia complicata Griseb. In the type collection, *Wright 2790*, the leaves are all entire, subrotund, and about 5 mm. long.

An excellent specimen, *Britton 2225*, recently received at the New York Botanical Garden from Guantanamo Bay, in extreme eastern Cuba, has leaves of the same character on the old shoots, while on the young branches they are flat or undulate and 10–15 mm. long. The Guantanamo plant is described as a shrub 1 m. tall with purple flowers.

Lepidaploa, *Scorpioideae aggregatae*

Vernonia Thomae Benth., included here by Gleason (Revision, 191), is now regarded as identical with *Vernonia albicaulis* Pers. Urban (Symb. Antill. 7: 421. 1912) has recently added a species, so that the number in the group remains four. They may be distinguished as follows:

A. Achenes pubescent; outer pappus conspicuous, its scales much broader than the white bristles of the inner series; leaves 2–3 cm. long. *Vernonia buxifolia* (Cass.) Less.

B. Achenes glabrous and glandular; outer pappus minute, its scales not sharply distinguished in width from those of the inner series.

  1. Leaves tomentulose beneath; pappus strongly tinged with rose color; heads about 11-flowered. *Vernonia Tuerckheimii* Urban.

  2. Leaves minutely puberulent or glabrous beneath; pappus yellowish or tawny; heads 8-flowered. *Vernonia montana* Gleason.

C. Achenes densely hirsute; outer pappus conspicuous, its scales chaffy and fimbriate; leaves 4–5 cm. long, closely gray-tomentose, and with prominent veins beneath. *Vernonia yunquensis* Gleason.

The first three species are all very similar in habit and structure, and are all natives of Hispaniola. There is no doubt that they are closely related. The character of the pappus and the larger leaves indicate that *V. buxifolia* is the primitive form. The distribution (Cuba) and the general habit of *V. yunquensis*, especially of the leaves, as expressed in pubescence and venation, separate it sharply from the first three species, and imply that it may logically constitute another species-group.

Vernonia segregata sp. nov.

A straggling or vinelike shrub, reaching a height of 2.5 m.; stem obscurely striate, closely pubescent; the branches olivebrown and finely tomentulose; leaves numerous, crowded, firm, dark green, oblong to elliptic-obovate, broadest at or above the middle, the principal ones 2.5–4 cm. long and 1–1.5 cm. wide, obtuse or subacute, entire, obtuse or rounded at the base, scabrellate and resinous-punctate above, glabrous beneath and densely punctate with resinous globules and impressed black glands; midvein puberulent, the lateral veins inconspicuous; petioles 1–2 mm. long; inflorescence terminal, irregular in shape, consisting of several short, simple or sparingly branched cymes 2–4 cm. long, naked below, and bearing 2–8 crowded heads in a terminal subcapitate cluster, or at the base of the branches; bracteal leaves 1–3 subtending each cluster of heads, resembling the cauline in shape, 5–15 mm. long; heads about 8-flowered; corollas white; involucre campanulate, 3–4 mm. high, its scales loosely and irregularly imbricated, appressed at the base, but spreading at the tip, stiff and firm in texture, the outer narrowly triangular-lanceolate, long-acuminate, the inner narrowly oblong-linear, tapering gradually to the acuminate puberulent apex; achenes thinly pubescent, 2 mm. long; pappus nearly white, the outer series 1 mm., the inner 4 mm. long.

Type, *Shafer 4050*, from rocky river banks in the vicinity of Camp San Benito, Oriente, Cuba, altitude 900 m., February 24, 1910, deposited in the Herbarium of the New York Botanical Garden. Other sheets in the same herbarium, all collected in the mountains of Oriente, are *Shafer 8051*, stated to be vinelike and 8 feet high; *Shafer 8216*, 1.5–2 feet high; and *Shafer 4446*, described by the collector as an herb three feet high with purple flowers. Notwithstanding field differences in the color of flowers or texture of stem, all four numbers clearly belong to the same species.

The relationship of *V. segregata* is puzzling. The subcapitate clusters clearly represent a modification of a scorpioid type, and most closely resemble the inflorescence of the *Scorpioideae aggregatae*. The involucre is quite different, however, from that of typical members of the group. For the present, it has been considered advisable not to assign the species to any group.

SPECIES-GROUP HAVANENSES

In recent work on *Vernonia*, *V. havanensis* and *V. Ottonis* have been considered identical (Revision, 192). The large series of specimens now available for study permits the ready separation of two species, with characters so typical that to each can be assigned the proper specific name without difficulty. In addition, a new species has been collected by Shafer and is described below.

With the exception of *V. pallescens*, whose position in this group is somewhat uncertain, the group is distinguished by similarities in habit. The leaves are of a comparatively broad type, widest near or usually above the middle, and with the serration most prominent on the distal half. The involucre scales are regularly pubescent in two areas on the back, one on each side of the mid-nerve.

The four species may be distinguished as follows:

A. Inflorescence strictly scorpioid; the cymes many-headed and elongated; heads all sessile. *Vernonia pallescens.*
B. Inflorescence freely branched and subpaniculate, some of the heads pedicellate; leaves with a tendency to be broadest above the middle; scales glandular on the back, especially on each side of the mid-nerve.
  1. Heads with 18 flowers or more; involucres 5–8 mm. high, or some of the scales 10 mm. long, distinctly purple-tinged; leaves essentially glabrous on both sides; pappus white, or with a faint brownish yellow tinge. *Vernonia havanensis.*
  2. Heads 5–13-flowered; involucres 3–4 mm. high, obscurely or not at all tinged with purple; leaves scabrous above; pappus pale brown.
    a. Heads 11–13-flowered; inner scales obtuse or subacute; inflorescence divaricate. *Vernonia Ottonis.*
    b. Heads 5-flowered, aggregated in subcapitate clusters at the ends of the branches, forming a pyramidal or subhemispheric inflorescence; inner scales acute. *Vernonia Orientis.*

Vernonia pallescens Gleason. The species certainly differs phylogenetically from the rest of the group, as shown by its inflorescence and its geographical distribution. It is included in the group merely for lack of a better place to put it.

VERNONIA HAVANENSIS DC. Prodr. 5: 37. 1836.

Vernonia stictophylla Wright, Sauv. Anal. Acad. Ci. Habana 6: 176. 1869.

The specimens at hand fall into two groups, the first with leaves long-attenuate at base, almost sessile, and thin in texture; the second with leaves cuneate into a distinct petiole and firm in texture. No other characters for their separation have been found. The first group includes the type collection for Wright's species. Both series have been collected, so far as data are given, in the province of Pinar del Rio.

VERNONIA OTTONIS Sch.-Bip. Linnaea **20**: 508. 1847.

Vernonia hieracioides Griseb. Mem. Am. Acad. **8**: 511. 1860.
Vernonia cubensis Griseb. Cat. Pl. Cuba 144. 1866.

Except one collection from Santa Clara (*Leon 1315*) and one from the Isle of Pines (Curtiss), all the sheets examined are from Pinar del Rio. They show considerable variation in the pubescence, serration, and texture of the leaves, but can not be further separated. The specimens include cotypes of both Grisebach's species, and agree perfectly with Schultz' description.

Vernonia orientis sp. nov.

Shrubby, as much as 6 m. in height, apparently not extensively branched; stem coarsely striate, glabrate below, becoming cinereous-puberulent in the inflorescence; leaves rigid, dark green, spreading, oblanceolate, the principal ones 9–11 cm. long by 2.5–3.5 cm. wide, abruptly short-acuminate or sharply acute, remotely dentate with sharp salient teeth, chiefly above the middle, attenuate from below the middle to a cuneate base, very scabrous above, minutely puberulent and scabrellate beneath; veins elevated below, only the midvein and its lateral branches prominent; petioles 5–10 mm. long; inflorescence terminal, broadly pyramidal or subhemispheric; cymes freely branching, ultimately bearing 2–6 heads aggregated or subcapitate near the tips; bracts subulate, 3–5 mm. long; heads 5-flowered; involucre 3–4 mm. high, campanulate; scales ovate to ovate-oblong, sharply acute or subacuminate, essentially glabrous but glandular on the back; achenes sparingly pubescent; outer pappus minute, the inner pale yellowish brown, 4 mm. long.

Type, *Shafer 3509*, from Sierra Nipe, near Woodfred, Oriente, Cuba, altitude 450–550 m., January 10, 1910, deposited in the Herbarium of the New York Botanical Garden.

The two collections, both from Oriente, are the only examples of the group from this part of the island. It is distinguished from the other members of the group at a glance by its inflorescence, and also by the involucral scales and the number of flowers.

Lepidaploa, *Paniculatae dichotomae*

VERNONIA MENTHAEFOLIA (Pöpp.) Less. Linnaea 4: 268. 1829.
Eupatorium menthaefolium Pöpp. in Spreng. Syst. 3: 412. 1826.
Vernonia Grisebachii Sch.-Bip. Jour. Bot. 1: 231. 1863.

The original description of this species by Pöppig is too brief to be of any value at the present time. But his specimens were preserved, and examined later by both Schultz and Lessing. Lessing gives a detailed description, based on these types, stating that the heads are many-flowered and 3 lines high. Schultz' description, referring without doubt to the same specimens, or to duplicates of them, indicates that the heads are 11-flowered and the involucre hardly 1 line high. He then described *V. Grisebachii*, as cited above, to include the forms with large heads, based on *Wright 1305*. Examination of an ample series of specimens at the present time reveals but one species, agreeing with Lessing's and Schultz' descriptions, but never with the small heads ascribed by the latter to *V. menthaefolia*. In the series examined are two of Wright's collections, *282* and *2792*, and *Shafer 8811*, which was found by Dr. Britton to agree with the specimen of *Wright 1305* in the Kew herbarium. Throughout the series the heads have 11 to 18 flowers, and the involucres are 4–5 mm. high. The leaves show considerable variation, from narrowly oblong-lanceolate, acuminate at both ends, to ovate, rounded at the base and acute at the apex. These characters are not sufficiently definite or constant to permit the recognition of two species.

V. menthaefolia is the most abundant species of the genus in Cuba, judged from the frequency of its collection, and occurs throughout the island.

Among recent accession to the Herbarium of the New York Botanical Garden is an *Eremosis* from the state of Durango, which differs distinctly from all the fifteen described species of the genus.

Eremosis ovata sp. nov.

Shrubby; height and habit not stated; stem obscurely striate, closely cinereous-pubescent, becoming tomentulose in the inflorescence; leaves thick, firm, ovate to ovate-elliptic, 7–10 cm. long, 4–5 cm. wide, obtuse or subacute, entire, obtuse at base, dull green, minutely and softly tomentulose above, densely cinereous-tomentose beneath; veins elevated below, the lateral ones prominent and ascending, the veinlets inconspicuous; petiole 8–13 mm. long; inflorescence broadly pyramidal or hemispheric, about 2 dm. wide; rameal leaves elliptic, about 2–6 cm. long, otherwise like the cauline; heads 4-flowered, in clusters of 3–8, on pedicels 2–5 mm. long; involucre narrowly campanulate, straw-colored or pale brown, 5–6 mm. high, outer scales short, broadly ovate, obtuse to subacute and apiculate, irregularly arachnoid or tomentulose, inner scales deciduous, oblong or ovate-oblong, acute, glabrous, or with minute patches of thin tomentum near the tip; achenes pale brown, 3 mm. long, prominently ribbed, thinly hirsute with ascending hairs; pappus white, 8 mm. long, the outer series much shorter.

Type, *Palmer 139*, from San Ramon, Durango, Mexico, deposited in the Herbarium of the New York Botanical Garden.

In general habit and shape of leaf, *Eremosis ovata* most closely resembles *Eremosis Steetzii* (Sch.-Bip.) Gleason, but is distinguished at once from this one-flowered species by its four-flowered heads. Its nearest relatives are probably to be found among the three-flowered species, such as *Eremosis Palmeri* (Rose) Gleason, from which it differs in the broad ovate leaves and dense tomentum.

The presence regularly of four flowers in each head is a peculiar feature, hitherto unknown in the genus. It is paralleled in a way, however, by the occurrence of two flowers instead of one in the heads of certain specimens of *Eremosis tarchonanthifolia* (DC.) Gleason.

UNIVERSITY OF MICHIGAN, ANN ARBOR.